

FORMATION OF SILICON-GERMANIUM-ON-INSULATOR
(SGOI) BY AN INTEGRAL HIGH TEMPERATURE SIMOX-Ge
INTERDIFFUSION ANNEAL

ABSTRACT OF THE DISCLOSURE

A method of forming a substantially relaxed, high-quality SiGe-on-insulator substrate material using SIMOX and Ge interdiffusion is provided. The method includes first implanting ions into a Si-containing substrate to form an implanted-ion rich region in the Si-containing substrate. The implanted-ion rich region has a sufficient ion concentration such that during a subsequent anneal at high temperatures a barrier layer that is resistant to Ge diffusion is formed. Next, a Ge-containing layer is formed on a surface of the Si-containing substrate, and thereafter a heating step is performed at a temperature which permits formation of the barrier layer and interdiffusion of Ge thereby forming a substantially relaxed, single crystal SiGe layer atop the barrier layer.